FACT SHEET FOR NPDES
PERMIT NO. WA-005214-1

CONAGRA FOODS, PACKAGED FOODS COMPANY, INC
dba LAMB-WESTON, INC., RICHLAND FACILITY

SUMMARY

ConAgra Foods, Packaged Foods Company, Inc., Lamb-Weston, Inc., Richland Facility (ConAgra) is seeking reissuance of the National Pollutant Discharge Elimination System (NPDES) Permit for its Richland, Washington facility. This facility processes raw potatoes into a variety of frozen potato products. In a letter dated November 15, 2004, the company requested that the ConAgra name be utilized in the permit in place of Lamb-Weston. The name change was the result of corporate restructuring.

This permit provides coverage for discharges of process wastewater to the company's onsite land treatment system and to the Yakima River. This permit authorizes discharges to the land treatment system, or sprayfield, not to exceed the loadings in the most recent, Department-approved Irrigation and Crop Management Plan and shall comply with the Land Application Best Management Practices detailed in Special Condition S4.C. During the period from October 1 through May 15, the Permittee is authorized to discharge treated wastewater to the Yakima River. ConAgra's discharge to the river is subject to categorical effluent guidelines contained in the Federal regulations; however, the effluent limits established in this permit are based on the more stringent treatment standard afforded by the company's advanced wastewater treatment facility.

The existing permit was issued in 1995 as construction was completed on the company's advanced wastewater treatment facility. The main treatment process of the facility consists of a Carrousel, a modified oxidation ditch. A sand filter process was added to the facility in 2000 to enhance removal of suspended solids from the discharge. During the years the treatment facility has been in operation it has become apparent to ConAgra and the Department that the design effluent limits were not attainable on a consistent basis. Consequently, whenever the discharge was likely to exceed the river effluent limits, ConAgra would send its effluent to the sprayfield. When this occurred during the non-growing season, which was allowed by the existing permit, loadings to the sprayfield could exceed agronomic rates. Therefore, this permit contains performance-based river discharge limits that have been revised slightly upward to reflect the treatment facility's actual treatment capacity. Revision of technology-based effluent limits that were never attainable is allowed by Federal regulations and does not constitute backsliding.

Hydraulic and organic loadings to the sprayfield will continue to be regulated through the Irrigation and Crop Management Plan and the Operations and Maintenance (O&M) Manual. The annual Irrigation and Crop Management Plan, technically Appendix B of the O&M Manual, contains loadings that are reviewed and approved by the Department at the beginning of each irrigation season. Sprayfield loadings are not directly addressed in the permit because the appropriate loadings change annually, depending on the nutrient and moisture needs of the crop and the residual nutrients and moisture in the soil from the previous crop.

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the State is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	ConAgra Foods, Packaged Foods Company, Inc. Lamb-Weston, Inc.,
Facility Name and Address	ConAgra Foods, Packaged Foods Company, Inc. Lamb-Weston, Inc., Richland Facility 2013 Saint Street Richland, WA 99352
Type of Facility:	Potato processing
SIC Code	2037
Discharge Location (Outfall #001)	Waterbody name: Yakima River, River Mile 9.5 Latitude: 46° 18' 30" N Longitude: 119° 19' 15" W
Discharge Location (Outfall #002)	Waterbody name: Ground water, via sprayfield S½ Section 28 and NW¼ Section 33, Township 10 N, Range 28 E. W. M. (approx.)
Water Body ID Number	Yakima River WA-37-1010 (Old) EB21AR (New)

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

ConAgra operates a potato processing facility at 2013 Saint Street in Richland, Washington. The facility processes and packages a variety of frozen potato products. There are three lines with the capacity to produce approximately 1.5 million pounds of finished product per day. The facility's production output may be adjusted depending on market supply and demand.

The plant is staffed with approximately 450 employees who process potatoes 24 hours per day, on an average of 6.3 days per week throughout the year, with the exception of periodic downtime for major maintenance.

Industrial Process

During the harvest season, some potatoes are delivered from the field to the plant for immediate processing while others are placed into raw storage. After harvest is complete, the stored potatoes are managed and utilized for plant production throughout the remainder of the year.

Raw product is brought into the plant and screened to remove dirt, rocks, and foreign material. The potatoes are then size-graded and washed. Subsequently, the potatoes are peeled, trimmed, cut, blanched, dried, fried, frozen, and packaged as necessary for the intended use.

Treatment Processes

The core of the wastewater treatment plant is an aerobic/anaerobic biological treatment system developed by EIMCO called the Carrousel System. The system consists of approximately 4 million gallons of water storage (4 days hydraulic retention, 15 days sludge retention time) in a concentric oval configuration. Wastewater enters a phosphate reduction chamber where a selected set of bacteria take up phosphate rapidly. Then wastewater enters a long folded channel where aeration allows aerobic bacteria to oxidize the waste to carbon dioxide and nitrate ions. As the waste continues in the channel the oxygen in the wastewater is depleted and the remaining carbonaceous wastes are used to denitrify the nitrate to nitrogen gas. Treated wastewater (effluent) is separated from the activated sludge in a clarifier and piped to the Yakima River for discharge. Waste activated sludge is either sent to a belt press or recycled to the Carrousel aeration basin for further use in the treatment process.

Discharge Outfalls

This facility has two discharge options for its treated effluent: the Yakima River and the sprayfield. The existing permit prohibits discharge to the Yakima River from May 16 to October 31 of each year, when treated effluent is used to irrigate sprayfield crops. The permit allows discharge to the river during the remaining months of the year, but the discharge is occasionally directed to the sprayfield when effluent concentrations are anticipated to exceed the stringent river discharge permit limits. The result is that the discharge is occasionally directed to the sprayfield during the non-growing season, when the crop is not available to take up nutrients in the discharge. While this practice is allowed by the permit, it is not an environmentally desirable practice and could, in the long term, adversely impact ground water quality. The proposed permit attempts to correct this situation by adjusting the river discharge effluent limits to more accurately reflect the treatment capabilities of the Carrousel system and reduce the need for sprayfield discharges during the non-growing season. See the PROPOSED PERMIT LIMITATIONS section of this fact sheet for more discussion of this subject.

River Discharge

The treated water proceeds west from the Carrousel to the Yakima River through approximately 7,000 feet of 12 inch PVC pipe to the outfall. The pipeline is bedded in native sand materials along its entire length at a depth of approximately 4 feet.

The Permittee's outfall is a flow dispersion box design located on the bank of the river. The dispersion box consists of a 7-foot square rock-filled concrete box screened on the river side. Effluent flows through the submerged screen, down the side of the streambed to the stratified

layer of water that is slightly colder and more dense than the discharge, where it disperses. This discharge process is less disruptive to aquatic life than a traditional diffuser because, rather than being diffused throughout the water column, the final disposition of the discharge takes into account the stratified nature of the receiving water.

Sprayfield Discharge

During warm weather months, treated wastewater from the Carrousel system is used to irrigate approximately 277.2 acres of cropland. The sprayfields consist of 92.2 acres of solidset sprinklers and two center pivot sprinklers of 101.9 acres and 83.1 acres.

PERMIT STATUS

The existing permit for this facility was issued on November 1, 1995 and was administratively extended on November 1, 2000. The permit places effluent limitations on the discharge to the Yakima River for the following parameters: flow, 5-day biological oxygen demand (BOD_5), total suspended solids (TSS), temperature, ammonia, chlorine and pH. Discharges to the sprayfield are regulated by hydraulic and organic loading limits detailed in the facility's Sprayfield Management Plan, which comprises Appendix B of the Operation and Maintenance (O&M) Manual.

ConAgra submitted two applications for permit renewal to the Department in May 2000: an NPDES permit application (for river discharge) and a State Waste Discharge permit application (for sprayfield discharge). Both applications were accepted by the Department on May 30, 2000.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

A compliance inspection without sampling was conducted on November 26, 2003.

Since issuance of the existing permit, the Permittee has remained in compliance based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department.

The existing permit was issued with interim river discharge effluent limits in a companion order and final river discharge effluent limits in the permit document. In the years since permit issuance, and as a result of years of experience operating the Carrousel treatment system, ConAgra and the Department have learned that the final effluent limits in the approved engineering report are not attainable. The order has been amended four times since it was originally issued to allow ConAgra to discharge under the interim limits until a new permit could be written with recalculated effluent limits. The current order is no. DE 95WQ-C241, dated November 1, 1995, and will remain in force until the effective date of this proposed permit.

WASTEWATER CHARACTERIZATION

River Discharge

Table 1 contains a characterization of ConAgra's discharge to the Yakima River based on DMR data submitted by the company. The data reflect discharges during the months of November through March, for the years 2001, 2002 and 2003. (Effluent was discharged to the sprayfield during the remaining months.)

Each seasonal average value is the cumulative average for each five-month season. The maximum daily values are the highest reported daily discharge values for each season. The discharge is characterized for the following regulated parameters:

Table 1: River Discharge Characterization

Parameter	2001-2002		2002-2003		Final Effluent Limits	
	Seasonal Average	Daily Maximum	Seasonal Average	Daily Maximum	Average Monthly	Maximum Daily
Flow, in MGD	1.04	1.53	1.12	1.60	1.5	1.75
BOD, in mg/L	6	14	5.9	15	10	20
TSS, in mg/L	9.2	36	3	11	10	20
Ammonia, in mg/L	0.21	2.52	0.09	1.4	0.6	3.0
Temperature, in ºC	NA	25.8	NA	27.2	NA	29

NA-No average monthly limit was established for temperature; for this reason average monthly discharge temperatures were not calculated.

The data suggest that, with the exception of TSS, ConAgra's discharges should easily comply with the final effluent limits. However, the company directed its discharge to the sprayfield whenever it appeared the river discharge limits would be exceeded. Therefore, the data set used to calculate river discharge limits in this permit is different than the data in Table 1 because the new limits incorporate data for discharges that were re-routed to the sprayfield. See the PERMIT LIMITATIONS section of this fact sheet for a discussion on the methodology used to calculate the new river discharge effluent limits.

Sprayfield Discharge

Table 2 contains a characterization of ConAgra's discharge to the sprayfield based on DMR data. The data reflect discharges from November 2002 through October 2003. There are no permanent sprayfield loading limits with which the data can be compared, because the hydraulic and organic requirements change annually depending on the crop type, residual soil moisture and nutrients left from the previous crop, and other factors.

Table 2: Sprayfield Discharge Characterization

Parameter	Mean	Minimum	Maximum
Flow, in MGD	1.23	0.044	1.70
BOD_5, in mg/L	11.4	3	48
TSS, in mg/L	9.6	1	51
TKN, in mg/L	5.6	2.1	29.5
Ammonia, in mg/L	1.5	0.01	25
Nitrate, in mg/L	3.2	0.1	16
Total Phosphorus, in mg/L	6.1	0.23	34
pH, in Standard Units	Not Calculated	6.64	7.82

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC).

Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

This permit establishes performance-based effluent limits for ConAgra's discharge to the Yakima River and continues the current process of adjustable loading limits for the discharge to the

sprayfield. The river discharge limits in this permit are revised slightly from the previous permit because, after approximately nine years operation of the Carrousel system, the Department and ConAgra have determined that the original technology-based effluent limits were never attainable on a consistent basis.

Concerning the discharge to the sprayfield, this permit retains the current practice of reviewing and approving the company's proposed sprayfield loadings for the upcoming irrigation season, contained in the annual Irrigation and Crop Management Plan. See the GROUND WATER QUALITY LIMITATIONS section of this fact sheet for further discussion of sprayfield loading limits and protection of ground water quality.

TECHNOLOGY-BASED EFFLUENT LIMITS

This section of the fact sheet first evaluates two sets of technology-based effluent limits: those developed from the Federal categorical treatment standards and the limits developed in the 1993 engineering report that developed AKART for this facility. However, due to some unique aspects of this situation, explained in the following paragraph, the limits the Department determined to be most appropriate to regulate this discharge during this upcoming permit cycle are based on best professional judgment, a third type of technology-based limit. Before the methodologies for calculating the different sets of limits are discussed and compared, the need for new limits is explained.

Considerations for Revising River Discharge Limits

The search for appropriate river discharge effluent limits in this permit involved two important considerations: 1) the inability to consistently comply with the technology-based limits contained in the 1993 engineering report, and 2) the desire of both ConAgra and the Department to reduce discharges to the sprayfield during the non-growing season. Although the river discharge limits in the existing permit are based on ConAgra's engineering report, these limits have proven to be unattainable on a consistent basis. The section of this fact sheet, **AKART Treatment Standard Based on the 1993 Engineering Report**, discusses the reasons for this more thoroughly.

The second consideration, revising the river discharge limits to reduce discharges to the sprayfield during the non-growing season, was more problematic. ConAgra routinely redirected the river discharge to the sprayfield whenever it anticipated the existing effluent limits would be exceeded. Therefore, the data set from which performance-based limits were calculated was expanded to include those historical discharges to the sprayfield made from November 1st through March 31st. (The characterization in Table 1 reflects *actual* discharges to the river only.) However, the company routinely removes the sand filter from the treatment train for sprayfield discharges, which raises the TSS concentrations and, consequently, increases variability of the data; therefore, the use of conventional statistical methods to calculate performance-based limits was not feasible. Performance-based effluent limits are required to be calculated from data that reflects proper operation and maintenance of the treatment system. The Department

acknowledges that treating effluent through the sand filter was not necessary for a sprayfield discharge; however, the use of sprayfield data to develop river discharge limits would not be appropriate.

Federal Categorical Treatment Standards

ConAgra's river discharge is subject to Federal categorical treatment standards for wastewater discharges to navigable waterways. This discharge is subject to the technology-based requirements contained in 40 CFR 407, Subpart D, *Frozen Potato Products Subcategory*. Lamb-Weston's discharge is subject to the requirements of subsection 45, entitled *Standards of Performance for New Sources (NSPS).*

The U. S. Environmental Protection Agency has determined the production-based NSPS for effluents from the Frozen Potato Products industry to be:

Table 3: Federal Categorical Effluent Guideline Values

Parameter	Monthly Average	Daily Maximum
BOD_5, lbs/1000 lbs raw product	0.17	0.34
TSS, lbs/1000 lbs raw product	0.55	1.10
Ph	Between 6 and 9.	

Guideline values are multiplied by the facility's production to determine mass loading effluent limits. For the ConAgra facility, using 1,500,000 pounds per day raw product:

Table 4: Calculated Mass Loading Effluent Limits

Parameter	Monthly Average	Daily Maximum
BOD_5, lbs/day	255	510
TSS, lbs/day	825	1650
pH	Between 6 and 9.	

For this facility, assuming an average discharge of 1,500,000 gallons per day, technology-based limits result in the following concentrations:

Table 5: Calculated Concentration Effluent Limits Based on the Federal Standards

Parameter	Monthly Average	Daily Maximum
BOD_5, mg/L	20	40
TSS, mg/L	66	132
pH	Between 6 and 9.	

Although the calculated BOD limits are only somewhat higher than the BPJ limits finally decided upon, ConAgra's treatment system has already demonstrated that it consistently

performs better. The calculated TSS limits are significantly higher than the highest TSS concentrations reported during the characterization period (see Table 1).

AKART Treatment Standard Based on the 1993 Engineering Report

ConAgra's wastewater treatment plant (treatment plant) was initially proposed for construction in an August 9, 1993 draft engineering report (ER) submitted to the Department. The submittal included the results from the pilot plant study. In the report, pilot study results were interpreted as showing that the full scale treatment plant could be operated to treat to 10 mg/L BOD_5. The Department did not concur, noting that the 95th percentile of the treated effluent data presented in the ER was 14 mg/L BOD.

Nonetheless, BOD_5 and TSS effluent concentrations of 10 mg/L were provided as anticipated discharge levels in the SEPA checklist. The SEPA process, with the City of Richland as lead, culminated in a Determination of Non-Significance for the proposed project (August 31, 1993).

Construction of the treatment facility began in late 1993 and startup operations began in September 1994. Since startup, the treatment facility has been treating all of the permittee's process wastewater. The only difference between treatment for discharges to the river and the sprayfield is that the sand filter is not included in the treatment train for the sprayfield discharge.

During the Carrousel system's initial months of operation, ConAgra encountered a series of startup problems common to any new treatment plant. However, the treatment efficiency of the system has improved over time, and from April 1995 to the present, the monthly average effluent concentrations for both BOD and TSS are often below 10 mg/L. These results, while very encouraging, are most consistent during operation in warmer months. During cooler months, when the company anticipates the discharge will exceed the river discharge effluent limits, ConAgra redirects the discharge to the sprayfield.

The Department is satisfied that ConAgra has conscientiously operated and maintained the treatment plant. Both the Department and ConAgra acknowledge that the original technology-based effluent limits were overly optimistic and unattainable on a consistent basis. Based on this determination, the proposed permit contains performance-based effluent limits that have been adjusted to more accurately reflect the treatment capabilities of the treatment system. The regulatory basis and methodology used to develop these performance-based limits are explained in the next section of this fact sheet.

BOD and TSS Performance-based Effluent Limits

Federal regulations allow the establishment of less stringent effluent limits when "the permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case the limitations in the reissued permit

may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit reissuance)" (40 CFR 122.44(l)2(i)E). The Department has determined that the requirements of this Federal regulation have been met and performance-based limits have been calculated as follows.

Performance-based effluent limits for BOD_5 and TSS in the discharge were developed in accordance with guidance in Chapter 4 of the Department's *Permit Writers Manual*, (Ecology Publ. No. 92-109). The permit writer first attempted to develop limits using traditional, statistically-based methods.

First, the Department's standard spreadsheet, PERFORMLIM.XLS, was used to develop revised limits. Table 6 contains relevant statistics for two seasons (November through March) of raw combined river and sprayfield data and the equivalent log normally-transformed values. There are 168 BOD data points and 54 TSS data points contained in their respective data sets.

Table 6: Statistical Summary of River-Sprayfield Data

Parameter	Raw River-Sprayfield Data			Transformed River-Sprayfield Data		
	Mean	Standard Deviation	Variance	Mean	Standard Deviation	Variance
BOD_5, in mg/L	6.93	6.58	43.26	1.6358	0.7667	0.5879
TSS, in mg/L	7.32	7.93	48.46	1.6653	1.0273	1.0555

The log-transformed means and variances were inserted into the spreadsheets, one each for BOD and TSS, and the resulting calculated effluent limits are as follows:

Table 7: Calculated Performance-based Effluent Limits Using PERFORMLIM.XLS

Parameter	Monthly Average	Daily Maximum
BOD_5, mg/L	12.7	30.5
TSS, mg/L	20.5	57.7

The spreadsheets may be found in Appendix C of this fact sheet. Although the BOD limits using this methodology are similar to those used in this permit, the TSS limits appear excessive because of the wide distribution of the data. For example, TSS data ranged from 0 to 36 mg/L.

The permit writer next attempted to develop effluent limits using a mathematically-based methodology described on page IV-18 of the *Permit Writers Manual*. The method is described in two sentences: The average effluent concentrations are increased by 50% to derive the 30-day average monthly limit. This 30-day limit is multiplied by 2 to derive the maximum daily limit.

Utilizing this method and the means in Table 6 results in the following limits:

Table 8: Calculated Performance-based Effluent Limits Using Math

Parameter	Average Monthly	Daily Maximum
BOD, in mg/L	10.35	20.70
TSS, in mg/L	10.98	21.96

These limits are only slightly different from the existing limits, which are acknowledged to be unattainable. Therefore, these limits were not utilized in the permit.

BOD and TSS Limits based on Best Professional Judgment (BPJ)

Due to the problems encountered with trying to use more traditional methodologies for calculating discharge limits, the absence of numerical BOD and TSS water quality criteria, and the Department's regulatory mandate to protect the water quality of the already-impaired Yakima River, the limits in this permit are a combination of statistics and BPJ. The resulting limits are presented in Table 9:

Table 9: BOD and TSS Effluent Limits Based on BPJ

Parameter	Average Monthly	Daily Maximum
BOD_5, in mg/L	15	25
TSS, in mg/L	15	30

The statistics that were considered in developing these limits are as follows:

Table 10: Statistical Bases of BPJ Effluent Limits

Parameter	90^{th} Percentile	95^{th} Percentile	99^{th} Percentile
BOD_5, in mg/L	14	19	33
TSS, in mg/L	17.8	19	36

As the tables show, the average monthly values are close to the 90^{th} percentile values of the data. The daily maximum values fall between the 95^{th} and 99^{th} percentile values. In the context of technology-based limits, the Department feels these limits are reasonable and justified because ConAgra's treatment system has already demonstrated it can meet these performance standards. The data sets on which these limits are based include sprayfield data, which were elevated because the sand filter was removed from the treatment train; however, because the river discharge will always be treated with this process, TSS concentrations should never reach 36 mg/L.

Gauging the possible impacts of the discharge to water quality is more difficult because, at this time, numerical water quality criteria for BOD and TSS have not been established. The narrative criteria prohibit degradation of receiving water quality as a result of the discharge, but the

impacts of BOD are difficult to quantify because they occur many miles downstream. ConAgra discharges into a receiving water shared by many other point source and non-point source dischargers, and at this time there does not exist any comprehensive method short of a Total Maximum Daily Load (TMDL) Study to evaluate the far field impacts of a single discharge in such a situation. Therefore, it is the best professional judgment of the Department that these limits will be protective of water quality in the Yakima River.

The segment of the Yakima River to which the Permittee discharges is listed as water quality-impaired for dissolved oxygen. The TMDL Study to address this listing has not been scheduled. The Permittee is cautioned that, in the event a wasteload allocation is developed for this discharge, this permit may be revised through a permit modification or at the next permit renewal.

pH

The technology-based pH limits of not less than 6 and not more than 9 is retained from the existing permit. These limits are the water quality-based limits of between 6.5 and 8.5, with a human-caused variation of no more than 0.5 below the lower limit and 0.5 above the upper limit, as found in WAC 173-201A-030(2)(c)(v). The minimum and maximum pH values reported by the company during the characterization period were 6.77 and 8.10, respectively. Since these values fall within the criteria no further analysis is warranted.

Chlorine

Once or twice a year Lamb-Weston utilizes chlorine to control filamentous bacteria in its wastewater treatment process. Chlorine is injected into the system through the return activated sludge piping. Due to an error in the existing permit, only 'chlorine' was specified as an effluent limit and monitoring parameter. However, WAC 173-201A-040(3) specifies 'total residual chlorine' as the appropriate parameter. Consequently, Lamb-Weston used an inappropriate measuring device that measured 'free chlorine', which does not measure the concentration of chloramines that the total residual chlorine analytical method would have captured.

Chlorine is a very reactive chemical that is rapidly consumed in the presence of organic materials. The Department suspects chlorine used to control filamentous bacteria will be consumed in the treatment process.

At this time there are no data to indicate a reasonable potential to exceed the water quality criteria. Furthermore, chlorine is used in the wastewater treatment system only very occasionally, and then only for process control.

A preliminary analysis was conducted to determine possible effluent limits for the discharge. The limiting (most stringent) criterion was determined to be the acute criterion, due to the low dilution factor available. Based on the acute dilution factor of 7 and the acute criterion of 19

µg/L, the maximum daily limit would be approximately 50 µg/L. (See LIMIT.XLS spreadsheet in Appendix C of this fact sheet.) In order for Lamb-Weston to meet this effluent limit, the company would have to dechlorinate the discharge, which would result in the introduction of sulfites into the river. Sulfites can cause high oxygen demand conditions in the river which can stress aquatic life.

For these reasons, this permit does not contain an effluent limit for chlorine. However, in order to gather data to verify compliance with the water quality standards, this permit requires Lamb-Weston to sample its discharge whenever chlorine is used and have the sample analyzed at an accredited laboratory.

Temperature

Temperature in the discharge is evaluated in the section of this fact sheet titled Consideration of Surface Water Quality-Based Limits for Numeric Criteria.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a State regulation designed to protect the beneficial uses of the surface waters of the State. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

Numerical Criteria for the Protection of Aquatic Life

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

Numerical Criteria for the Protection of Human Health

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish consumption and drinking water from surface waters.

Narrative Criteria

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) waters in the State of Washington.

Antidegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

Critical Conditions

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

Mixing Zones

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The fact sheet associated with the existing permit stated that ConAgra is applying AKART to the river discharge and was entitled to mixing zones, but for unstated reasons did not explicitly authorize mixing zones or establish dilution factors. This permit authorizes two sets of mixing zones: one set for ammonia and the other for temperature. Different mixing zones for temperature and ammonia are authorized due to 1) their dissimilar toxicities and 2) the methodologies used to calculate dilution factors.

Ammonia

The modeling used to assess the impact of ammonia in the discharge, which can be potentially toxic, is discussed earlier in this fact sheet, in Technology-Based Effluent Limitations. The modeling was conducted in 2000 and was pollutant-specific. The modeling was conducted to demonstrate that the technology-based ammonia limits were in compliance with the water quality criteria. A result of the modeling was that acute and chronic dilution factors were developed for the discharge. The calculated acute dilution factor was 7 and the chronic dilution factor was 17. The modeling study was reviewed and approved by the Department in a letter dated September 21, 2000.

Temperature

Separate dilution factors for temperature in the discharge were calculated because both the EPA and the Department do not consider heat in the same class of pollutants as ammonia. While ammonia is a man-made substance introduced into the environment, much of the heat load in the Yakima River is due to solar radiation, although the problem is likely made worse by deforestation of riparian zones, dams and irrigation withdrawals. Both EPA and the Department are in the policymaking process to determine how point-source discharges to temperature-impaired streams will be addressed.

Two methodologies were used to calculate potential dilution factors for temperature in the discharge: a mass-balance algorithm and the RIVPLUME5 computer-based model. The mass-balance calculations and the RIVPLUME5 spreadsheet are presented in the Technical Calculations section of this fact sheet (Appendix C). Both methods utilize the increased effluent flows authorized by this permit. The most stringent (lowest) results were from the mass-balance calculations and are established as the authorized dilution factors in this permit.

Table 11: Dilution Factors for Temperature

Methodology	Acute	Chronic
Mass-Balance	Not applicable	70
RIVPLUME5	50	96

In summary, the smaller dilution factors developed with the CORMIX model were utilized in development of the water quality-based effluent limits for ammonia. However, a less stringent chronic dilution factor (70) was utilized to assess temperature in the discharge. The regulatory point of compliance for the temperature limit is the edge of the chronic mixing zone (WAC 173-201A-030(2)(c)(iv). Less stringent dilution factors were applied to temperature in the discharge because discharge to the river is authorized only during cool weather months, when the criteria is unlikely to be exceeded, and the heat load is expected to quickly dissipate.

Description of the Receiving Water

The facility discharges to the Yakima River, which is designated as a Class A receiving water in the vicinity of the outfall. The City of West Richland's wastewater treatment plant outfall is located approximately two-tenths of a mile upstream of ConAgra's discharge. Significant nearby non-point sources of pollutants include stormwater runoff from agricultural lands and urban areas. Characteristic uses include the following:

> water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation. Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

The most recent (1998), approved 303(d) list for waters not meeting State Water Quality Standards shows that the Yakima River is listed for several conventional parameters and pesticides. These parameters include: 4-4'-DDD, 4-4'DDE, ammonia N, arsenic, chlorpyrifos, DDT, dieldrin, dissolved oxygen, endosulfon, fecal coliform, instream flow, mercury, PCB-1254, PCB-1260, pH, silver, temperature, total phosphorus, and turbidity.

A TMDL has been completed for the Yakima River to deal with TSS and associated DDT and other pesticide residues. That TMDL showed that the major load of sediments were caused by agricultural runoff and did not result from point source discharges.

The Department is currently conducting a TMDL Study of the Granger Drain for fecal coliform bacteria. The Granger Drain is a principal tributary to the Lower Yakima River and has been identified as a major contributor to the river's exceedances of the fecal coliform bacteria water quality criteria. The major source of fecal coliform bacteria in the drain was identified as agriculture. The Department anticipates that, with the successful completion of the Granger Drain TMDL, levels of fecal coliform bacteria in the river will decrease significantly.

Concerning the nutrient-related listings (phosphorus, ammonia and dissolved oxygen), although TMDL Studies by the Department have not been scheduled, an interagency research project to address eutrophication of the Lower Yakima River has just begun. Although the project is not a TMDL Study, it is expected to help identify the causes of overabundant aquatic plant growth in the river that results in depressed dissolved oxygen levels. TMDL Studies for the remaining parameters have not yet been scheduled.

Surface Water Quality Criteria

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992).

Consideration of Surface Water Quality-Based Limits for Numeric Criteria

Pollutant concentrations in the discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of surface water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for flow in the Yakima River during the cool weather months was determined to be approximately 750 cubic feet per second (cfs). The fact sheet associated with the existing permit described this value as the minimum (7Q10) winter flow (November 1st to May 15th), based on data for the period from 1981 to 1994. The 7Q10 flow is defined as the seven day average low river flow with a recurrence interval of ten years. The ambient background data used for analysis of the discharge were taken from the CORMIX data preparation sheet:

Table 12: Receiving Water Characteristics

Parameter	Value used
Velocity	2.59 ft/sec
Depth	5.58 feet
Width	304 feet
Roughness (Manning)	n=0.03
Temperature	21.67ºC
Dissolved Oxygen	8.0 mg/L

The impacts of dissolved oxygen deficiency and temperature were determined as shown below, using the dilution factors at critical conditions described above. Evaluation of ammonia in the discharge was discussed earlier in this fact sheet.

BOD_5--This discharge, with technology-based limitations, results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. The adverse impacts of BOD, which occur many miles downstream of the discharge point, are expected to be minimal due to significant dilution in the lower Yakima and Columbia

Rivers. Based on this rationale and in the best professional judgment of the Department, the technology-based limitations in this permit will be protective of the dissolved oxygen criterion in the receiving water.

According to the most recent 303(d) list, the lower Yakima River is considered water quality impaired for DO. The TMDL to address this water quality impairment has not been scheduled. ConAgra is cautioned that, in the event a TMDL is conducted and wasteload allocations are established, the BOD effluent limits may be revised through a permit modification or at the next permit renewal.

Temperature--WAC 173-201A-130(141) contains a special provision for temperature: temperature shall not exceed 21ºC due to human activities. When natural conditions exceed 21ºC, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3ºC; nor shall such temperature increases, at any time, exceed t=34/(T+9). "t" represents the maximum permissible temperature increase measured at the mixing zone boundary; and "T" represents the background temperature at a point unaffected by the discharge and representative of the highest ambient temperature in the vicinity of the discharge.

This permit authorizes discharges to the river only during the cooler months of November through March, when river temperatures range from 2.4°C to 15°C, so the above paragraph is not applicable to this discharge.

The existing permit established that the lowest 7Q10 winter flow in the Yakima River at this location, for the months from November through March, is approximately 750 cubic feet per second (cfs). Maximum permitted discharge of treatment plant effluent is 2.0 MGD, or 3.1 cfs.

The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at the critical condition. The receiving water temperature at the critical condition is 7.16^{o}C and the effluent temperature is 22.97^{o}C. Both values are 90th percentile values. The chronic dilution factor used in the analysis is 70. The predicted resultant temperature at the boundary of the chronic mixing zone is 7.39^{o}C and the incremental rise is 0.23^{o}C.

This proposed permit retains the existing 29ºC effluent limit at the treatment works. The Permittee estimates that the effluent discharged at this temperature drops about 6°C as it flows though the 1,700 feet of buried pipe to the river. Although the 0.3ºC provision cited above does not apply to this discharge, this analysis shows that the discharge complies with the spirit of the regulation.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent

limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The only toxics determined to be present in the discharge were ammonia and, occasionally, chlorine. Table 11 contains the ammonia effluent limits contained in the existing permit and in the proposed permit.

Table 13: Existing and Proposed Ammonia Limits

	Existing Permit Limits/Criteria		Proposed Permit	
Parameter	**Average Monthly**	**Maximum Daily**	**Average Monthly**	**Maximum Daily**
Ammonia, in mg/L	0.6	3.0	4.4	8.9

The ammonia limits established in the 1995 permit were based on compliance with the calculated water quality criteria without the benefit of an authorized mixing zone, at end-of-pipe. The water quality criteria calculated for the existing permit were: acute 3.0 mg/L, chronic 0.6 mg/L. At that time it was not certain whether the newly-constructed Carrousel system could consistently comply with the limits. Furthermore, the Department did not have a methodology capable of evaluating compliance of a sidebank discharge. The permit required an effluent mixing study to be conducted if the discharge didn't consistently comply with the effluent limits. Subsequently, ConAgra exceeded the average monthly limit of 0.6 mg/L and conducted the study.

The company conducted the effluent mixing study in 1999. The company's consultant's utilized version 3.2 of CORMIX, an EPA-approved model developed to evaluate effluent discharges into water bodies. CORMIX is a more sophisticated model than the methods available to permit writers in the past. The model predicted an acute dilution factor of 7 and a chronic dilution factor of 17 to assure compliance with the water quality criteria for ammonia. These dilution factors were utilized to calculate water quality-based limits for ammonia in the proposed permit. The results of the modeling were verified by the Department and approved on September 21, 2000. The water quality-based ammonia limits in the proposed permit were calculated using the Department's standard spreadsheet, WQPB2.WK1.

Whole Effluent Toxicity

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing.

Toxicity caused by unidentified pollutants is not expected in the effluent from this discharge as determined by the screening criteria given in Chapter 173-205 WAC. The only toxic anticipated to be routinely present in the discharge is ammonia, and this effluent constituent is well quantified and regulated with effluent limits. Chlorine is used occasionally in the treatment system up to twice a year to control filamentous bacteria, but is unlikely to be present in the discharge to the river, because it is a highly reactive substance and is expected to be readily consumed during the treatment process. Therefore, no whole effluent toxicity testing is required in this permit. The Department may require effluent toxicity testing in the future if it receives information that toxicity may be present in this effluent.

Human Health

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the State by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health. The discharge will be reevaluated for impacts to human health at the next permit reissuance.

Sediment Quality

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

GROUND WATER QUALITY

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

Ground water quality has been monitored monthly since November 1992 in six monitoring wells. One monitoring well was located at the west edge of the land treatment site to characterize upgradient water quality (MW-1). Five additional monitoring wells were located within the land treatment site to characterize ground water quality in the sprayfield (MW-2 through MW-6).

Data collected in the background well can be used to set limits in ground water for regulated substances. At this facility, installation of the ground water monitoring wells that could be used for compliance purposes revealed that ground water quality had been impaired by previous land application practices, which included discharge of minimally treated wastewater to the sprayfield on a year round basis. In response to this finding, ConAgra constructed the Carrousel treatment system and began seasonal discharge of wastewater to the Yakima River during the non-growing season.

The table below contains averaged data for certain significant parameters that characterize ground water quality at the land treatment site. The existing data are divided into two sets. The first set are average concentrations beginning in November 1992 and ending March 1999. The second set is the average concentration beginning April 1999 and ending March 2004, or the last five years of data. The purpose for dividing the data set is to illustrate the general improvement in ground water quality, mostly for nitrate, since the construction and operation of the Carrousel system and the improved management of the land treatment site by diverting winter wastewater application from the land treatment site to the Yakima River. Nitrate has uniformly responded well to the combination of Carrousel treatment and seasonal application. TDS and chloride are not treated by the carrousel but are somewhat responsive to the seasonal application schedule. Thus, the concentrations of these parameters are more erratic over time and from well to well.

Table 14: Ground Water Quality Characterization

Monitoring Well (MW)	**Concentrations, in mg/L**				
MW-1 (Upgradient Well)	**NO_3-N**	**Cl**	**TDS**	**SO_4**	**Na**
Data 11/1992-3/99	5.6	17.5	484	128	54
Data 4/99-3/04	7.6	14.4	395	49	62
MW-2					
Data 11/1992-3/99	58.2	113	1222	115	159
Data 4/99-3/04	44.9	148	1221	100	106
MW-3					
Data 11/1992-3/99	30.7	80	750	76	33
Data 4/99-3/04	11.8	96	736	55	49
MW-4					
Data 11/1992-3/99	49.6	97	917	78	53
Data 4/99-3/04	16.2	85	713	57	51
MW-5					
Data 11/1992-3/99	57.0	125	1053	101	90
Data 4/99-3/04	30.4	100	936	88	59
MW-6					
Data 11/1992-3/99	40.3	106	1115	102	168
Data 4/99-3/04	31.0	177	1166	104	125

Due to the high quality of effluent from the Carrousel and filter treatment processes and improved sprayfield management procedures, it is the best professional judgment of the Department's Regional Hydrogeologist that ground water effluent limits are not warranted at this time. Water quality data will continue to be collected routinely from the monitoring wells to track the trend of the significant parameters. Acquisition of additional water quality data, such as through increased monitoring frequency, additional monitoring parameters, installation of additional monitoring wells, or hydrogeologic, soils, or engineering investigations may be necessary to respond to the results from the routine monitoring data.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in this permit under Special Condition S2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

This permit appears to contain a more extensive monitoring program than the existing permit, but the differences primarily involve moving much of the sprayfield monitoring schedules from the O&M Manual into the permit document. The existing permit incorporated sprayfield monitoring by reference to allow flexibility in revising monitoring frequencies to find the most effective sampling program. After nearly 10 years of collecting data, trends in ground water quality have become apparent, and understanding of the sampling required to assure compliance with the ground water quality standards have solidified, so the Department is formalizing the sprayfield monitoring program by inserting it into the permit.

The discharge to the sprayfield is sampled before it enters the irrigation system. The parameters monitored remain unchanged from the existing permit, with one exception: total organic carbon has been dropped from the list. However, anions and cations that were formerly sampled quarterly will now be sampled monthly. The monitoring frequency for these parameters is increased during this permit cycle because of the variability of the data. Similarly, the ground water monitoring program remains unchanged, except that the requirement for sampling for total organic carbon has been removed.

Monitoring of the facility's discharge to the Yakima River has been slightly modified from the previous program. There are two clarifications. The existing permit specifies NH4-N ammonium-nitrogen as an effluent limit and monitoring parameter. The State's water quality standards specify ammonia (WAC 173-201A-040(3). Although there is no practical difference between ammonium and ammonia from the analytical perspective, the proposed permit specifies ammonia to be consistent with the regulation. A similar ambiguity in the existing permit

occurred with chlorine. The permit limited and required monitoring for chlorine, not total residual chlorine, as specified in WAC 173-201A-040(3). Unfortunately, the company analyzed for free chlorine, utilizing a hand-held field measurement instrument. The proposed permit requires the company to analyze its wastewater specifically for total residual chlorine at an accredited laboratory.

LAB ACCREDITATION

With the exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.* The company previously analyzed its wastewater samples in an onsite accredited laboratory, but has since discontinued its operation. Samples are now sent to an offsite accredited laboratory for analysis.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The requirements of Special Condition S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

SPILL PLAN

The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to State waters and for minimizing damages if such a spill occurs. In its application for permit renewal, ConAgra states that, in the event of a spill in the facility, the gutter system will convey the spill to the wastewater treatment plant. In addition, the facility has the flexibility to divert spill water to the sprayfield. However, the company acknowledges the possibility that a spill could occur that may not be captured by the treatment system. Therefore, the company developed a comprehensive Spill Plan in 1996, and the plan is incorporated into the O&M Manual as Appendix C. Noteworthy elements of the plan include refresher training for appropriate plant personnel, as needed, and integration of spill response procedures into the facility's Safety Awareness and Training Program.

SOLID WASTE PLAN

The Department has determined that the Permittee has a potential to cause pollution of the waters of the State from leachate of solid waste.

This permit requires, under the authority of RCW 90.48.080, that the Permittee update the solid waste plan whenever the company's management of its solid waste is modified. The plan must be submitted to the local permitting agency for approval, if necessary, and to the Department.

OPERATION AND MAINTENANCE

In accordance with State and Federal regulations, the Permittee is required to take all reasonable steps to properly operate and maintain the treatment system (40 CFR 122.41(e)) and WAC 173-220-150 (1)(g). An Operation and Maintenance (O&M) Manual was submitted as required by State regulation for the construction of wastewater treatment facilities (WAC 173-240-150).

In 1996, the Company submitted a comprehensive O&M Manual. O&M of the mechanical portion of the wastewater treatment system is described in Chapter 2 and Appendices A and D. The Irrigation and Crop Management Plan is contained in Appendix B. The Irrigation and Crop Management Plan is revised annually in the Annual Discharge Monitoring Report, submitted by ConAgra at the beginning of each growing season. Section 5.0 of the monitoring report consists of the Irrigation and Crop Management Plan and is an effective adaptive management tool that reflects the dynamic nature of the land treatment system. The Annual Discharge Monitoring Report contains crop yield, soil analysis and ground water data reflecting sprayfield operations for the previous year. The Irrigation and Crop Management Plan proposes hydraulic and nutrient loadings for the upcoming year. The remaining portions of the Annual Discharge Monitoring Report describes general trends of the condition of the sprayfield, crop rotations, and ground water quality.

GENERAL CONDITIONS

General Conditions are based directly on State and Federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended State or Federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this proposed permit be issued for 5 years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Washington State Department of Ecology.

Laws and Regulations(http://www.ecy.wa.gov/laws-rules/index.html)

Permit and Wastewater Related Information
(http://www.ecy.wa.gov/programs/wq/wastewater/index.html

Wright, R.M., and A.J. McDonnell.
1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A -- PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on July 24, 2002 in the Tri-City Herald to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on March 28, 2005 in the Tri City Herald to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 509/457-7105 or by writing to the address listed above.

APPENDIX B -- GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Responsible Corporate Officer-- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the State of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C -- TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at http://www.ecy.wa.gov.

Dilution Factors Calculated Using Mass-balance Algorithm

Mass-balance calculations are allowed by WAC 173-201A-100(7)(a)(ii) and -(8)(a)(ii) for determining chronic and acute dilution ratios, respectively. The rule allows use of 25 percent of the river flow to calculate the chronic dilution factor and 2.5 percent of the river flow to calculate the acute dilution factor. The fact sheet associated with the existing permit lists a minimum (7Q10) winter flow (November 1st to May 15th) of 750 cfs, based on data for the period from 1981 to 1994. The 7Q10 flow is defined as the seven day average low river flow with a recurrence interval of ten years.

The mass-balance calculations were performed as follows:

$$DF=\frac{(Qa+Qe)}{Qe}$$

where: DF is the dilution factor;
Qa is the regulatory allowable ambient flow, in cubic feet per second (cfs); and
Qe is the appropriate effluent flow, converted to cfs (permitted average monthly flow for the chronic calculation permitted daily and the maximum flow for the acute calculation).

Chronic

$$DF_c = \frac{(187.5 + 2.7)}{2.7}$$

$$DF_c = 70.26$$

Acute

$$DF_a = \frac{(18.75 + 3.1)}{3.1}$$

$$DF_a = 7.05$$

CALCULATIONS OF WATER QUALITY-BASED LIMITS FOR TOTAL RESIDUAL CHLORINE

	Dilution (Dil'n) factor is the inverse of the percent effluent concentration at the edge of the acute or chronic mixing zone.						Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations							Statistical variables for permit limit calculation				
	Acute Dil'n Factor	Chronic Dil'n Factor	Water Quality Standard Acute	Water Quality Standard Chronic	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	LTA Coeff. Var. (CV)	LTA Prob'y Basis	Limiting LTA	Coeff. Var. (CV)	AML Prob'y Basis	MDL Prob'y Basis	# of Samples per Month	
PARAMETER			*ug/L*	*ug/L*	ug/L	ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*decimal*	*decimal*	*ug/L*	*decimal*	*decimal*	*decimal*	*n*	
Chlorine	7.00	70.30	19.00	11.00	**48.2**	**50.8**	133	773.30	42.7	407.9	0.60	0.99	42.7	0.08	0.95	0.99	1.00	1.00
											0.60	0.99		0.60	0.95	0.99	4.00	1.00
											0.60	0.99		0.08	0.95	0.99	30.00	1.00

This spreadsheet calculates water quality based permit limits based on the two value steady state model using the State Water Quality standards contained in WAC 173-201A. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 99. Last revision date 9/98. Written by G. Shervey.

CALCULATIONS OF PERFORMANCE-BASED BOD AND TSS EFFLUENT LIMITS

CONAGRA BOD PERFORMANCE-BASED EFFLUENT LIMITS

USE EXCEL TO PERFORM THE LOGNORMAL TRANSFORMATION
AND CALCULATE THE TRANSFORMED MEAN AND VARIANCE

LOGNORMAL TRANSFORMED MEAN =	1.6358
'LOGNORMAL TRANSFORMED VARIANCE =	0.5879
NUMBER OF SAMPLES/MONTH FOR COMPLIANCE MONITORING =	4
AUTOCORRELATION FACTOR(ne)(USE 0 IF UNKNOWN) =	0
E(X) =	6.8878
V(X) =	37.963
VARn	0.1824
MEANn=	1.8386
VAR(Xn)=	9.491
MAXIMUM DAILY EFFLUENT LIMIT =	30.547
AVERAGE MONTHLY EFFLUENT LIMIT =	12.693

12.693 11.95555

CONAGRA TSS PERFORMANCE-BASED EFFLUENT LIMITS

USE EXCEL TO PERFORM THE LOGNORMAL TRANSFORMATION
AND CALCULATE THE TRANSFORMED MEAN AND VARIANCE

LOGNORMAL TRANSFORMED MEAN =	1.6654
'LOGNORMAL TRANSFORMED VARIANCE =	1.0555
NUMBER OF SAMPLES/MONTH FOR COMPLIANCE MONITORING =	4
AUTOCORRELATION FACTOR(ne)(USE 0 IF UNKNOWN) =	0
E(X) =	8.9634
V(X) =	150.515
VARn	0.3841
MEANn=	2.0011
VAR(Xn)=	37.629
MAXIMUM DAILY EFFLUENT LIMIT =	57.689
AVERAGE MONTHLY EFFLUENT LIMIT =	20.504

20.50433 19.0542

WATER QUALITY-BASED PERMIT LIMITS FOR ACUTE AND CHRONIC AMMONIA CRITERIA
(based on EPA/505/2-90-001 Box 5-2).

Based on Lotus File WQBP2.WK1 Revised 19-Oct-93

INPUT

1. Water Quality Standards (Concentration)	
Acute (one-hour) Criteria:	1540
Chronic (n-day) Criteria:	351
2. Upstream Receiving Water Concentration	
Upstream Concentration for Acute Condition (7Q10):	35
Upstream Concentration for Chronic Condition (7Q10):	35
3. Dilution Factors (1/{Effluent Volume Fraction})	
Acute Receiving Water Dilution Factor at 7Q10:	7
Chronic Receiving Water Dilution Factor at 7Q10:	17
4. Coefficient of Variation for Effluent Concentration (use 0.6 if data are not available):	0.600
5. Number of days (n1) for chronic average (usually four or seven; four is recommended):	4
6. Number of samples (n2) required per month for monitoring:	4

OUTPUT

1. Z Statistics	
LTA Derivation (99%tile):	2.326
Daily Maximum Permit Limit (99%tile):	2.326
Monthly Average Permit Limit (95%tile):	1.645
2. Calculated Waste Load Allocations (WLA's)	
Acute (one-hour) WLA:	10570.000
Chronic (n1-day) WLA:	5407.000
3. Derivation of LTAs using April 1990 TSD (Box 5-2 Step 2 & 3)	
Sigma^2:	0.3075
Sigma^2-n1:	0.0862
LTA for Acute (1-hour) WLA:	3393.850
LTA for Chronic (n1-day) WLA:	2851.833
Most Limiting LTA (minimum of acute and chronic):	2851.833
4. Derivation of Permit Limits From Limiting LTA (Box 5-2 Step 4)	
Sigma^2-n2:	0.0862
Daily Maximum Permit Limit:	8881.911
Monthly Average Permit Limit:	4427.255

APPENDIX D -- RESPONSE TO COMMENTS

No comments were received by the Department of Ecology.